CLAIMS

1. A process for manufacturing an aluminum-killed medium-carbon steel strip comprising:

- supplying a hot-rolled steel strip comprising by weight from 0.040 to 0.080% of carbon, from 0.35 to 0.50% of manganese, from 0.040% to 0.070 of aluminum, from 0.0035 to 0.0060% of nitrogen, and the remainder being iron and trace impurities,
- passing the strip through a first cold-rolling, and
- annealing the cold-rolled strip;

wherein the annealing step is a continuous annealing using a cycle comprising a temperature rise up to a first temperature higher than an onset temperature of pearlitic transformation Ac_1, holding the strip above the first temperature for a duration of longer than 10 seconds, and rapidly cooling the strip to a second temperature of below 350°C at a cooling rate in excess of 100°C per second.

2. The process according to claim 1, wherein the process further comprises performing a secondary cold-rolling after said annealing step.

3. The process according to claim 1, wherein the strip is maintained during annealing at said first temperature of from 720°C to 800°C for a duration ranging from 10 seconds to 2 minutes.

4. The process according to claim 1, wherein the cooling rate is from 100°C to 500°C per second.

5. The process according to claim 1, wherein the strip is cooled to room temperature and the cooling rate is in excess of 100°C per second.

6. The process according to claim 1, wherein the annealing step is a continuous annealing using a cycle comprising:

- a temperature rise up to a first temperature higher than an onset temperature of

pearlitic transformation Ac_1,

- holding the strip above said first temperature for a duration of longer than 10 seconds,

- rapidly cooling the strip to a second temperature of below 100°C at a cooling rate in excess of 100°C per second,

- thermally treating the strip at low temperature ranging from 100°C to 300°C for a duration in excess of 10 seconds, and

- cooling to room temperature.

7. An aluminum-killed medium-carbon steel sheet, comprising, by weight, from 0.040 to 0.080% of carbon, from 0.35 to 0.50% of manganese, from 0.040 to 0.070% of aluminum, from 0.0035 to 0.0060% of nitrogen, with the remainder being iron and trace impurities, wherein the steel sheet has an aged condition percentage elongation A% satisfying the relationship:

$$(640 - Rm)/10 \leq A\% \leq (700 - Rm)/11$$

where Rm is a maximum rupture strength of the steel, expressed in MPa.

8. A steel sheet according to claim 7, wherein the steel contains carbon in free state and/or some carbides precipitated at low temperature, and has a grain count per mm^2 greater than 20000.

9. A container comprising an aluminum-killed medium-carbon steel sheet formed into the container shape, comprising, by weight, from 0.040 to 0.080% of carbon, from 0.35 to 0.50% of manganese, from 0.040 to 0.070% of aluminum, from 0.0035 to 0.0060% of nitrogen, with the remainder being iron and trace impurities, wherein the steel sheet has an aged condition percentage elongation A% satisfying the relationship:

$$(640 - Rm)/10 \leq A\% \leq (700 - Rm)/11$$

where Rm is a maximum rupture strength of the steel, expressed in MPa.

10. The container according to claim 9, wherein the steel steel contains carbon in free

state and/or some carbides precipitated at low temperature, and has a grain count per mm^2 greater than 20000.